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SOUTH CAROLINA
College of Arts and Sciences

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Legacy

South Carolina Institute of Archaeology and Anthropology

Christopher Amer Retires

By Steven D. Smith

Christopher F. Amer, SCIAA's State Underwater Archaeologist and Head of the Maritime Research Division (MRD) retired in August 2012. Chris came to SCIAA in 1987 from Parks Canada, where he had been an Archaeological Site Assistant in the Archaeological Research Division of the Environmental program for six years. Born in Vancouver, Canada, he did his undergraduate studies at the University of British Columbia and Simon Fraser University, majoring in archaeology. He graduated from the Nautical Archaeology Program at Texas A&M University with an M.A. in Nautical Archaeology in 1986. His thesis was an analysis of a the Brown's Bay vessel, an early 19th century British naval vessel in Canada. In 1999, he completed a Graduate Certificate in Museum Management through the McKissick Museum at USC.

In the 25 years as Head of MRD, Chris oversaw 45 research projects while managing all aspects of the division. Select completed projects include underwater archaeological consultant to the Subdirección de Arqueología Subacuática, Instituto Nacional de Antropología e Historia, Mexico, Flota Project, Campeche 2003-2004 and Bahia Vergara Survey, Veracruz in 2009, Co-

Principal Investigator-South Carolina State House Project 1997-98, Co-Principal Investigator-Port Royal Sound Survey 1997-2012, Co-Principal Investigator-Pritchard Shipyard Project, South Carolina 1993-96, Principal Investigator-Malcolm Boat Project, South Carolina 1992-93, and Principal Investigator-Post Hurricane Hugo Freda Wiley and Jonathan May Survey, 1989. Under Chris' supervision, the MRD completed a five-year project for the Department of Defense to survey

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Director's Note

By Steven D. Smith
SCIAA Associate Director

In the last issue of *Legacy*, I mentioned that the Institute is making steady progress toward improving our infrastructure.

With the leadership of College of Arts and Sciences, Dean Mary Anne Fitzpatrick, and our fearless Director, Charlie Cobb, we are also implementing personnel changes that will assist us in serving the state for the future.

First, we welcome James Spirek, who was piped aboard in August as the new State Underwater Archaeologist. Jim replaced retiring Chris Amer. Chris bravely took the helm of the Maritime

Research Division more than 20 years ago and navigated it through the rough budgetary seas of the last few years. We thank Chris for his Nelsonesk leadership of the division and wish him fair winds in retirement. Now Jim has the helm, and we look forward to the next horizon. (I love sailing metaphors). Aptly, this issue highlights some of the great research Jim is doing researching Civil War shipwrecks around Charleston Harbor.

Second, we also welcome James B. Legg as our new Public Archaeologist. Jim replaces (if that's possible) Tommy



The Chickasaw Project photo log states that this picture shows (left to right) volunteers Adam Crowley, Brian Hicks, and Raymond Dougherty with SCIAA's Kim Wescott and Charlie Cobb as they ponder a strange feature found while excavating a midden pit in Mississippi, July 2012. However, I distinctly remember this picture was taken immediately after Charlie accidentally dropped a whole Mississippian pot down the farmer's well. (SCIAA photo)



Chickasaw Archaeologist Brad Lieb discusses a find with Jim Legg (on left) and Chester DePratter (right) at Okla Tchitoka. (SCIAA photo)

Charles, who for many years was the face of the institute for volunteers and artifact collectors. Jim will also assist our curator Sharon Pekar on a part-time basis. This is a position we have desperately needed for some time and filling it begins a new era in SCIAA public outreach. I believe just about everyone who reads this will already know Jim, his amazing font of knowledge of material culture, and his eternal optimism. As Jim would say, "That's just great."

This issue of *Legacy* highlights not only the Maritime Research Division (MRD), but also SCIAA's global reach—Chris Gilliam article, for instance. He has been doing exciting things in central Mongolia in collaboration with the Russians and Mongolians. Meanwhile, Al Goodyear's Topper site is once again in the forefront of a controversial hypothesis that a massive comet exploded over Canada 12,000 years ago. The impact changed the North American continent's environment and landscape, not to mention causing a really bad day for PaleoIndians. If true, it will radically change our understanding of South Carolina's prehistory, or at least

make it possible for a new round of NSF grants.

In other news, the Chickasaw team returned to Tupelo, Mississippi in March and July 2012 to continue researching two battles between the French and Chickasaw in 1736. Graduate student Stacey Whitacre joined team veterans Charlie Cobb, Chester DePratter, Jim Legg, Kim Westcott, Keely Lewis, and I. The goal of the March trip (Part Deux) was to search for the Okla Tchitoka battlefield. Despite years of collector activity at the suspected site, we still found solid evidence of the Okla Tchitoka village in the form of 18th century metal artifacts and ceramics. Yet, while these artifacts confirmed the village, they did not confirm the battlefield. Not to worry; Chester soon came up with a new theory that narrowed the search area, and we went back to Okla Tchitoka (Part Tre) in July to test it. Jim Legg was especially happy to return, as he really enjoys being in the field during the hottest and muggiest part of the year. During the fieldwork, I was especially happy when Chester asked me to get a GPS reading on one of his metal detector finds that turned

out to be located in briars so thick that I had to crawl under them to get to it. And it made it even more special that the artifact turned out to be a modern buckshot. What was he doing in there anyway? Despite the heat, poison-ivy-infested-briars, and of course chiggers, we found additional evidence that lead us to feel pretty confident we have located the 1736 battlefield. Just to be sure, we are planning yet another trip in January 2013. You just can't be too sure. Once again the people of Tupelo and the Chickasaw Nation opened their homes to us with receptions, and once again, we happily accepted. Enjoy this issue of *Legacy*.

AMER RETIRES, From Page 1

the U.S. Naval Wrecks in South Carolina waters, including Admiral Dalgren's flagship, U.S.S. *Harvest Moon*, in Winyah Bay. One of the most well-known projects Chris was involved with was the recovery of the *H.L. Hunley*. Chris was Co-Principal investigator of the *H.L. Hunley* 1996 Assessment Project and the 1999 USS *Housatonic* Survey, as well as a diving member of the *Hunley* Recovery Team. He also served as an historical consultant on the made-for-TV movie, "The *Hunley*." Chris has over 20 publications, 43 professional presentations, served on seven thesis committees, and was continually presenting his research to the public in forums across the state.

Chris plans to return to Vancouver, Canada, in his retirement, but will continue to work with the Maritime Research Division through the fall of this year as they complete work at the Mars Bluff Confederate Navy Yard, and search for the Lucas Vazquez De Ayllon's *Capitana* thought to be in Winyah Bay, near Georgetown, South Carolina.

Maritime Research Division

The Archaeology of Civil War Naval Operations in Charleston Harbor, 1861-1865

By James D. Spirek

Introduction

Following the opening shots onto Fort Sumter on 12 April 1861 until the evacuation of the fort and city by Confederate forces on 17 February 1865, Charleston Harbor was the scene of a protracted struggle between Confederate and Union naval and ground forces during the Civil War (Fig. 1). Blockaded and assaulted by Union land and naval forces, Confederate defenders deployed a variety of counter measures to keep the opposing force at bay. On land, a series of strong forts, key ones including Fort Sumter and Fort Moultrie, and earthen batteries situated on key points in the harbor and nearby sea islands ringed and guarded the port city from several anticipated Federal avenues of approach. On the water, a small squadron of ironclads and other vessels, along with a series of physical obstructions, composed of log booms, ropes, pilings, and torpedoes (mines) provided a deterrent to Union warships entering the harbor. Novel vessels were

also employed to strike at the Federal fleet stationed offshore, including *Davids*, a class of steam powered semi-submersibles, and a submarine, *H.L. Hunley*, the first successful combat submarine in history, which sunk the USS *Housatonic* on 17 February 1864. Blockade runners evading the Union gauntlet provided a tenuous lifeline with the outside world by exporting cotton, rice, and naval stores in exchange for needed military supplies, as well as luxury goods.

On the Union side, a large fleet stationed off the channels at Charleston Harbor maintained a blockade to prevent military necessities and commercial products from reaching the south. Naval forces also engaged in offensive movements by launching the highly anticipated naval assault on Charleston Harbor that occurred on 7 April 1863; it was decisively repulsed by Confederate coastal artillery. The navy assisted army movements on James Island and along the Stono River, the backdoor to the city, and

especially during the campaign for Morris Island in 1863. The largest contingent of ironclad vessels in the Union arsenal underscored the political importance of taking the city, oftentimes referred to as the "Cradle of Secession." As Federal forces aimed for the political head of the Confederacy at Richmond, punched the body in the West, the combined naval and land forces at Charleston struggled to pierce the heart. Ultimately, Confederate steadfastness and ingenuity, along with waxing and waning Union military and political objectives to taking Charleston, resulted in a stalemate between the two combatants. A deadlock only broken by the abandonment of the city by Confederate forces caused by the flanking march through South Carolina by Federal forces under Major General William T. Sherman. Only then did the United States flag once again fly over the now shapeless ruin of Fort Sumter.

Archaeological Manifestations of the Naval Operations

Following four years of defending, blockading, and assaulting with various implements of war, both sides of the conflict left an array of cultural features on the battlefield. Unlike many battlefields that may last one day or several days leaving few traces, the siege of Charleston Harbor lasted for four years with a plethora of evidence showing the intensity of the fighting. On the Confederate side, several auxiliary steamers, *Etiwan*, *Manigault*, and *Sumter*, lie on the harbor floor. Several land batteries now lay inundated under harbor waters, most notably Battery Wagner and Fort Ripley. Prior to the outbreak of the war, Confederate forces sank four block ships at the bar of the Main Ship Channel to prevent Federal warships and

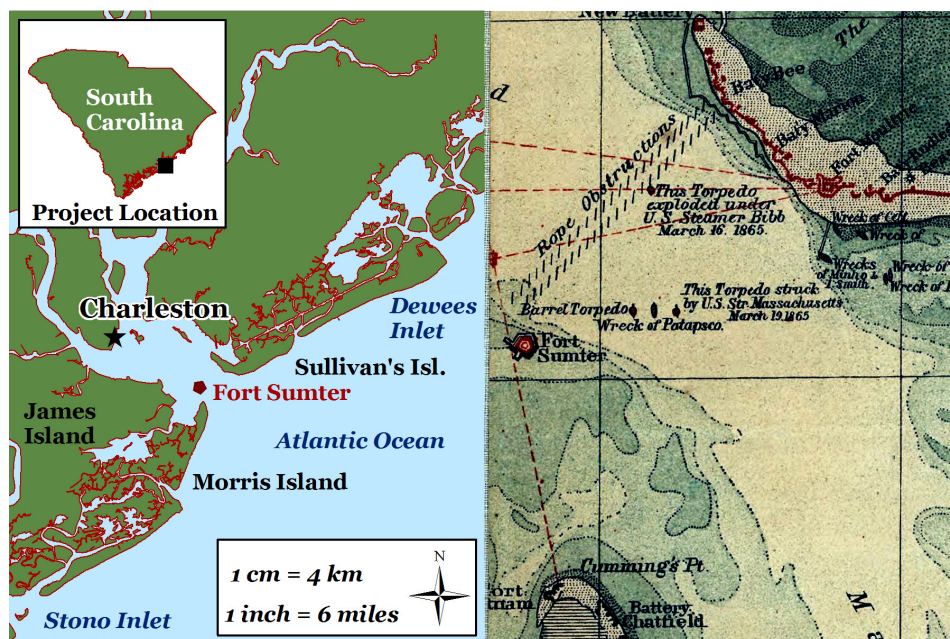


Fig. 1: The project location and detail of Confederate defenses at the throat of the harbor between Forts Sumter and Moultrie. (SCIAA graphic)

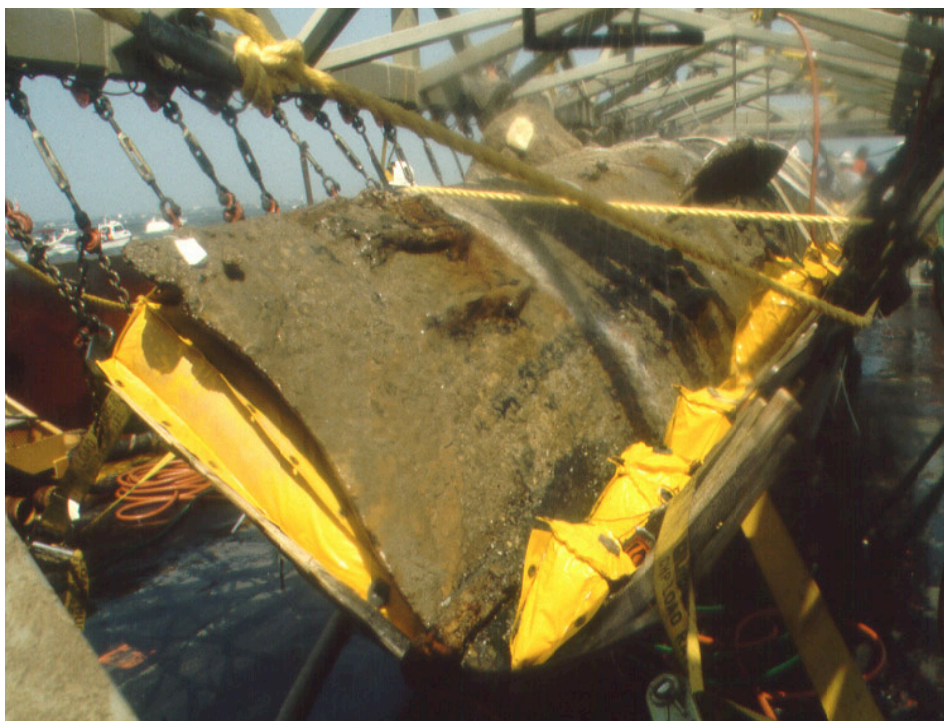


Fig. 2: *H.L. Hunley* in the slings after its recovery in 2000. (SCIAA photo by Christopher F. Amer)

supply steamers from entering to aid in the relief of besieged Fort Sumter in early 1861. Other obstructions developed as the siege continued including a series of log booms stretching across the harbor entrance, a row of pilings placed between Castle Pinckney and Fort Ripley, and several sets of frame torpedoes in various channel locations in the harbor. Evidence of the floating log booms may not exist; however, piling stumps may indicate the position of the row obstructions. A number of ill-fated blockade runners, both underwater and now under the beach, rest off Fort Moultrie, as well as along the since closed northern approach into the harbor through Maffit's Channel. The remains of the Confederate submarine, *H.L. Hunley*, once lay hidden on the bottom off Charleston Harbor near its victim, *USS Housatonic*. After its discovery (1995) and recovery (2000) the *H.L. Hunley* now resides in a conservation tank undergoing preservation, eventually slated for display at a purpose built museum in North Charleston (Fig. 2).

On the Federal side, a number of vessels and other relicts provide testimony to the Union attempt to take the city. In a vain attempt to close the harbor to blockade runners, 29 ex-New England

whaling and merchant vessels were sunk at the two main ship channels and were quickly consumed by the shifting sediments. Three ironclads, two the victims of enemy actions (*USS Patapsco* and *Keokuk*), and the other from foundering (*USS Weehawken*), rest on the harbor floor (Fig. 3). Another remnant of the ironclad fleet, an anti-torpedo raft known as the *Devil* and used by *Weehawken*, reportedly resides in the marsh behind Morris Island. The first victim of a combat submarine, *USS Housatonic*, lies buried under several feet of overburden five miles offshore. There are also several Federal batteries including the "Swamp Angel," with portions remaining visible in the marsh, and Battery Shaw and the Surf Battery, both of which potentially exist, but are now inundated off Morris Island.

Naval Battlefield of Charleston Harbor

During the investigations at the *Hunley-Housatonic* Naval Engagement Site from 1996-2000, underwater archeologists from the National Park Service's Submerged Resources Center put forward the idea that the engagement between the Confederate submarine and the Union blockader represented a battlefield. Giving

further thought to this concept over the subsequent years, and when examined within the larger context among the many events that occurred off Charleston Harbor from 1861-1865, the action that night was essentially a skirmish, an action, or an affair that occurred on a battlefield. It is not too hard to think of Charleston Harbor as a battlefield during the Civil War, as this was the location of one of the most heavily fortified ports on earth opposing a large naval and land contingent bent on its destruction. That was the concept that the MRD wanted to develop—to understand the larger naval battlefield of Charleston Harbor, to expand beyond the *H.L. Hunley* and *Housatonic* action, and to explain the circumstances of the other Confederate and Union shipwrecks, along with associated archaeological features, remaining on this field of coastal conflict. In a manner similar to excavating an archaeological site composed of a number of individual artifacts or features, while the artifact itself is important, but perhaps more important is its context within the assemblage, which in turn helps to gain a better understanding of the site itself. And that was our objective, to better understand and interpret the Charleston Harbor Naval Battlefield.

In 2008, the Maritime Research



Fig. 3: Sonogram of the remains of the bow of *Patapsco*. (SCIAA graphic)

Division (MRD) prepared and was awarded an American Battlefield Protection Program grant administered by the National Park Service to study the naval battlefield of Charleston Harbor. The focus of this project was on the offensive and counter-offensive measures used at the main naval avenue of approach into Charleston via the Atlantic Ocean by way of Charleston Harbor. Through archaeological remains and historical research, the project aimed to identify the boundary, and the various core and defining features, of the battlefield, namely the wrecks of ironclads and blockade runners, now-submerged land batteries, and obstructions. Historical and previous archaeological research guided field operations to pinpoint known sites and to survey for historically-documented battlefield related cultural features. One problem noted in past surveys in the Charleston area, and throughout the state, is the actual known and documented sites oftentimes are hundreds of yards away from their historically or archaeologically recorded locations. Therefore, a key goal of this project was to precisely re-locate previously documented sites using DGPS, as well as to determine the scope and extent of the wreckage using a variety of appropriate electronic devices. Research and field operations undertaken to identify these known and potential features from both sides of the conflict served to develop a more complete understanding of the battlefield to aid in the interpretation and preservation of these Civil War resources.

Survey Methodology and Results

From 2009 to 2011, the MRD launched several forays onto the naval battlefield to conduct marine and terrestrial remote sensing and diving operations to detect previously-located and undetected archaeological resources related to the Civil War. Marine magnetic and acoustic surveys occurred in several

areas in attempts to locate the First and Second Stone Fleets sunk off Charleston to obstruct the main channels into the harbor, remnants of now-submerged batteries including Battery Wagner and Fort Ripley, and inner harbor obstructions including frame torpedoes and row pilings. We dived on several magnetic/acoustic anomalies and wreck sites, namely the monitor *Patapsco*, the blockade runners *Mary Bowers* / *Georgiana* and *Constance*, the remains of the First Stone Fleet, and Fort Ripley. Several terrestrial features were documented including the reported remains of the “*Devil*,” a torpedo raft used by the USS *Weehawken* during the ill-fated 7 April 1863 Federal attack on Fort Sumter, the now-naturalized site of the “Swamp

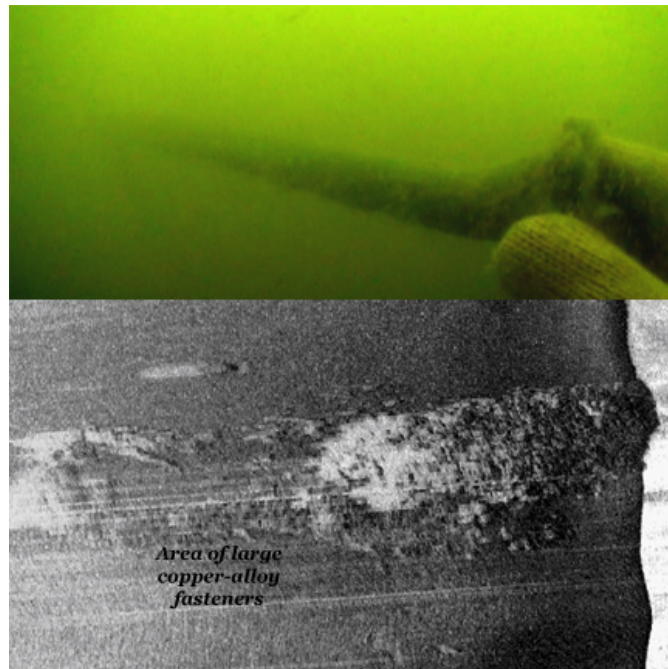


Fig. 4: Large copper-alloy fastener on a First Stone Fleet ballast mound with sonogram showing general location of the large fasteners on the shipwreck. (SCIAA photo and graphic)

Angel” battery used to launch projectiles into Charleston, and the remains of several blockade runners now inland on Sullivan’s Island and Isle of Palms. The remainder of the article will focus and discuss two areas of the naval battlefield that the MRD investigated—the stone fleets and the remains of blockade runners.

Stone Fleet investigations

One of many naval actions that occurred on the battlefield was the sinking of two stone fleets by the Federal navy at the entrances to the two main channels.

The First Stone Fleet, consisting of 16 New England ex-whaling and merchant vessels, was sunk at the Bar of the Main Ship Channel in late 1861, while a Second Stone Fleet, consisting of another 13 similar vessels, was sunk at the entrance to Maffitt’s Channel. The sunken stone-filled hulks were intended to prevent Confederate blockade runners from entering the port with war material and other supplies, and exiting the port laden with cotton, rice, and naval stores for foreign markets. These acts to obstruct the harbor channels earned the U.S. government international condemnation, especially from the United Kingdom, which was reliant on cotton imports, as well as Confederate derision—despite the

irony that South Carolina forces had earlier attempted to obstruct the same channels by sinking four hulks to prevent Federal reinforcements during the Fort Sumter crises in early 1861. At the Main Ship Channel, the First Stone Fleet had a limited effect on subsequent blockade running activities. The channel was never the primary route into the harbor for blockade runners, especially as the Union naval fleet increased with the addition of ironclads, gunboats, and support vessels to support Union land forces efforts to take Morris Island in the summer and fall of 1863. As large pieces of the shipwrecks associated with the First Stone Fleet broke up and drifted away or washed ashore, the assumption

of many was that the hulks had simply sunk into the “quicksands” of the bar—an assumption that has persisted to recent times.

In an effort to locate the First Stone Fleet, and to determine whether the hulks were buried or exposed on the sea floor, the MRD undertook extensive marine remote sensing operations, equipped with a cesium magnetometer, side-scan sonar, and sub-bottom profiler, at the old entrance to the Main Ship Channel. Covering a large search area, magnetic

and acoustic evidence started to mount that the remains of the First Stone Fleet had been located, and that they were exposed on the bottom. Eventually, a total of 15 ballast mounds, a wreck marked on an 1858 nautical chart, and one modern wreck were detected on the ocean floor. Visual inspection by MRD underwater archaeologists and volunteers on several of the shipwrecks noted the presence of small to medium-sized river cobble and field stones, various iron structural elements, and numerous copper-alloy fasteners. At one of the sites, large copper-alloy fasteners used to fasten the keel, deadwood, and other components of the stern area together were found bent over indicating the collapse of the ship structure as it deteriorated from ship worms and storms (Fig. 4).

In addition to dispelling the notion that the stone fleet vessels had sunk and disappeared into the bar, two interesting observations were noted, both having to do with the distribution of the ballast mounds (Fig. 5). The Union commander and the newspaper reporters observing the operations reported that the vessels were sunk in an indented or checkerboard fashion to prevent a blockade runner from steering a straight course through the obstructions. Mapping the ballast mounds determined that the shipwrecks appear to be distributed in a more random pattern than historically reported. Additionally, of the 15 ballast mounds, 14 of them are tightly packed together at the bar of the old Main Ship Channel, with one outlier approximately 440 yards away to the east. Conceivably, this allowed for an unobstructed passage way for a blockade runner to evade the concentrated area of sunken ships.

As mentioned, only 15 ballast mounds were confirmed, one of the shipwrecks remains undetected and will require additional investigation to locate. Besides locating the elusive ballast mound, future fieldwork will begin the process of archaeologically documenting the extant remains of the stone fleet, including attempts to provide names to the wrecks like the *Corea*, originally an armed British

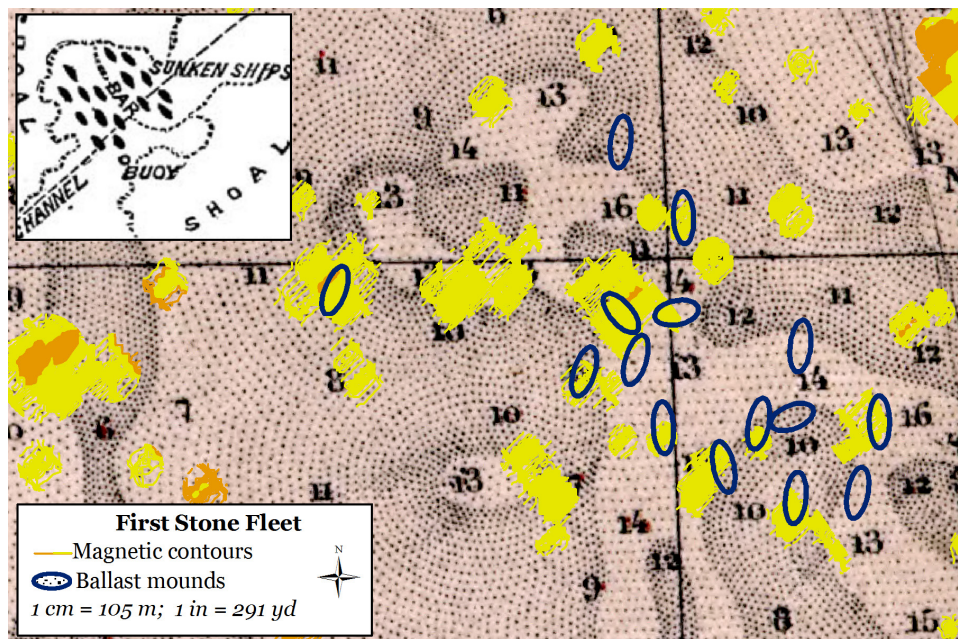


Fig. 5: Distribution of the First Stone Fleet ballast mounds at the old entrance to the Main Ship Channel. The inset shows a map depicting the historically documented dispersal of the hulks. (SCIAA graphic)

transport ship captured by American Patriots during the Revolutionary War, and the ex-whaling vessel, *Robin Hood*, the only hulk of the stone fleet burnt as a signal to the Confederates.

MRD also undertook marine remote sensing survey operations at the suspected area of the Second Stone Fleet at the entrance to Maffitt's Channel and Rattlesnake Shoal. A wreck (SF2-1) loaded with extremely large stones and iron capstan components was detected and visually investigated by MRD archaeologists and volunteers. Nearby to this shipwreck and marked on modern nautical charts are several obstructions and wrecks. MRD investigated these sites to determine their association if any with the stone fleet. Visual inspection of these four sites revealed that three of the sites were practically identical to the SF2-1 site, even down to having the same capstan components, while one of the charted wrecks was not discovered. Expansion of survey coverage east, and perhaps west, north, and south, should eventually pinpoint the remains of this stone fleet. And to put a positive spin on negative data, at least we know where the Second Stone Fleet isn't.

Based on the size of the boulders, evidence of quarrying, and proximity to each other, MRD believes these wrecks

were lighters or scows used to transport rocks to build the Charleston Harbor jetties from 1878 to 1896. These wrecks most likely fell victim to one of the hurricanes that struck the area as the jetties were being built. Historical research of Charleston newspapers during this time period found an article reporting on damages sustained during the hurricane of 25 August 1885, included the sinking of four lighters loaded with stone by Howlett & Company, the contractors for the jetties. Archaeological evidence suggests that these rock-laden wrecks represent the remains of these lighters from the private contractor's fleet. Investigating the shoreline in front of Fort Moultrie, which had been shored up with rocks during the 1870s reveals stones with similar quarrying patterns as those found on the wrecks. More research is needed to solidify the identity of these wrecks and their connection with the jetty project.

Wrecked Blockade Runners

The primary objective of the Union navy's South Atlantic Blockading Squadron entailed blockading the port of Charleston to prevent the entrance and exit of Confederate blockade runners importing war material and other supplies and exporting cotton, rice, and naval stores. To effect the blockade a gauntlet of

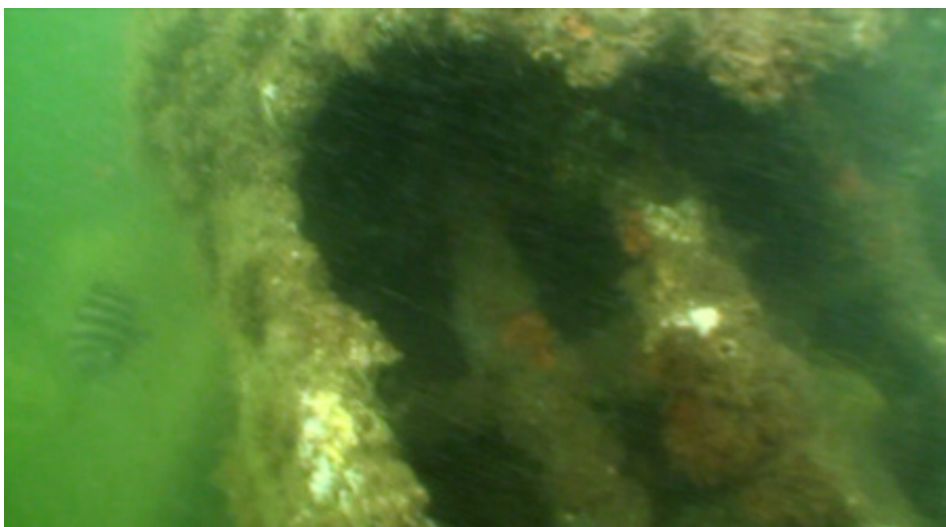


Fig. 6: Fire tubes inside one of the boilers at the wreck of the blockade runner *Constance*. (SCIAA photo)

sailing and steam warships posted from Dewees Inlet to Stono Inlet and at the various channels leading into the harbor, along with the two stone fleets, aimed to deny passage to and from the harbor. The obstruction at the Main Ship Channel along with a heavy Federal naval presence forced the blockade runners to evade the blockade via Maffitt's Channel along Sullivan's Island. By 1863 and continuing through the war, the Union blockading fleet was composed of an Outer Blockade comprised of wooden sailing and steam warships that stood off Charleston Harbor at the entrances to the harbor, and an Inner Blockade composed of the ironclads operating in the Main Ship Channel off Cummings Point on Morris Island at the throat of the harbor. Additionally, scout and picket launches armed with boat howitzers and manned by Union sailors operated during the night between Cummings Point and Sullivan's Island to signal and prevent the entrance and exit of blockade runners.

From the Confederate perspective, in an effort to maintain navigation through Maffitt's Channel for the blockade runners, a string of Confederate batteries along the beachfront of Sullivan's Island, equipped with artillery capable of firing projectiles three to four miles in distance, kept the Union navy at bay and created a narrow passageway into Charleston Harbor. The presence of the Second Stone Fleet and the Union blockaders

forced the blockade runners to skirt along the northern edge of the blockade near Dewees Inlet and then to navigate the corridor between the blockaders and the beachfront aiming for Charleston Harbor. This was accomplished at night, during moonless nights and at high tides to increase the odds of successfully dodging the blockaders and the dangers of shoals. While the vast majority of blockade runners evaded the blockade, a number of blockade runners wrecked along the shores of Charleston Harbor attest to the presence and maintenance of the blockade by Union naval forces.

MRD archaeologists conducted marine remote sensing operations and visual inspections of several blockade runners sunk at Charleston Harbor, including the remains of the *Georgiana*, *Mary Bowers* and *Constance* off Isle of Palms (Figs. 6 and 7). A search for a concentration of blockade runners at Bowman's Jetty and along the waterfront of Fort Moultrie failed to detect the presence of several blockade runner wrecks marked on an 1865 nautical chart. The apparent absence of the wrecks in the water suggested instead they lie buried under the accreted shoreline of Fort Moultrie. Georeferencing an 1865 nautical chart over modern imagery tends to support this idea. A limited terrestrial gradiometer survey, conducted by Dr. Jonathan Leader, the State Archaeologist, seemed to have magnetically detected at

least two of the beach-bound shipwrecks, which await further investigations.

Besides performing reconnaissance on individual shipwrecks, the MRD wanted to record the pattern of the wrecked blockade runners remaining on the naval battlefield. The remains of the blockade runners are in two clusters with two outliers, and all represent their efforts to elude the Union blockaders and attempt to enter and exit the harbor via Maffitt's Channel. The first cluster off the Isle of Palms is comprised of six wrecks. All of these wrecks were victims of the Outer Blockade and were attempting to run on the inside of the blockaders and the Second Stone Fleet and hug the shoreline to exit or enter the harbor. The vessels came to grief through accidental and intentional groundings, oftentimes with large caliber projectiles headed their way in the darkness. These wrecks include the *Georgiana*, the *Mary Bowers*, which struck the aforementioned wreck, and the *Constance* which reportedly struck the other two wrecks before sinking.

The second cluster, composed of seven wrecks at Fort Moultrie and Bowman's Jetty on Sullivan's Island, represent victims of the Inside Blockade. They either were on their way to sea or inward bound having successfully passed the Outer Blockade. The next gauntlet was the Inside Blockade that was patrolled by small Union launches and the monitors, and the ships were subsequently accidentally or intentionally grounded while attempting to elude their pursuers. There are at least two outliers, *Raccoon*, accidentally grounded while inward bound, was escaping gunfire from the Union blockaders, while *Ruby* had lost its bearing in the night while inward bound and grounded at Lighthouse Inlet between Morris and Folly Islands. Both, however, were attempting to enter the harbor via Maffitt's Channel. Insight gleaned from archaeologically documenting the positions of the wrecked blockade runners revealed their "end-around" attempts to evade the Federal attempts to blockade the harbor through the placement of the Second Stone Fleet as an obstruction and

the line of wooden and ironclad blockaders via Maffitt's Channel.

Conclusions

Historical and archaeological investigations conducted during the course of the project provided an opportunity to more fully explore and interpret this unique assemblage of shipwrecks and other features remaining on the Charleston Harbor Naval Battlefield. In addition to determining the battlefield boundaries and locating cultural resources, the results of

including navigation improvements, such as maintenance dredging and channel widening, and beach renourishment have the potential to impact the cultural legacy of not only Civil War related materials, but also those from other historical periods as well. The results of this project and continued research endeavors will help to provide guidance to managers charged with the protection of these cultural resources affiliated with the naval operations during the siege of Charleston.

The MRD recently completed a

fortifications, obstructions, and naval actions that took place on the Charleston Harbor Naval Battlefield. The digital version of the final report documenting the scope and findings of the project will be available for download along with this article. We hope the reader will take the opportunity to visit the website to augment the material found in this article. See the MRD webpage at: http://artsandsciences.sc.edu/sciaa/mrd/regsvys_chashbr.html.

Acknowledgements

The author would like to thank the volunteers that have helped on this project by participating in the diving portions of the project including Arnold Postell of the South Carolina Aquarium for the use of their vessel to support diving operations on *Patapsco*. Other volunteers include Ted Churchill, Phil Jones, Dr. Paul Work, Dr. Scott Harris, Andy Ogburn, Billy Semple, Dr. Jonathan Leader, State Archaeologist, and volunteers who assisted in conducting gradiometer investigations for buried blockade runners on Sullivan's Island and Isle of Palms. Additional thanks go to the staff of the MRD, SCIAA, and USC in implementing the fieldwork, financial, and compliance issues related to the grant. We also want to acknowledge Kristen

McMasters and Matthew Borders of the National Park Service's American Battlefield Protection Program for their assistance and guidance during the grant project.

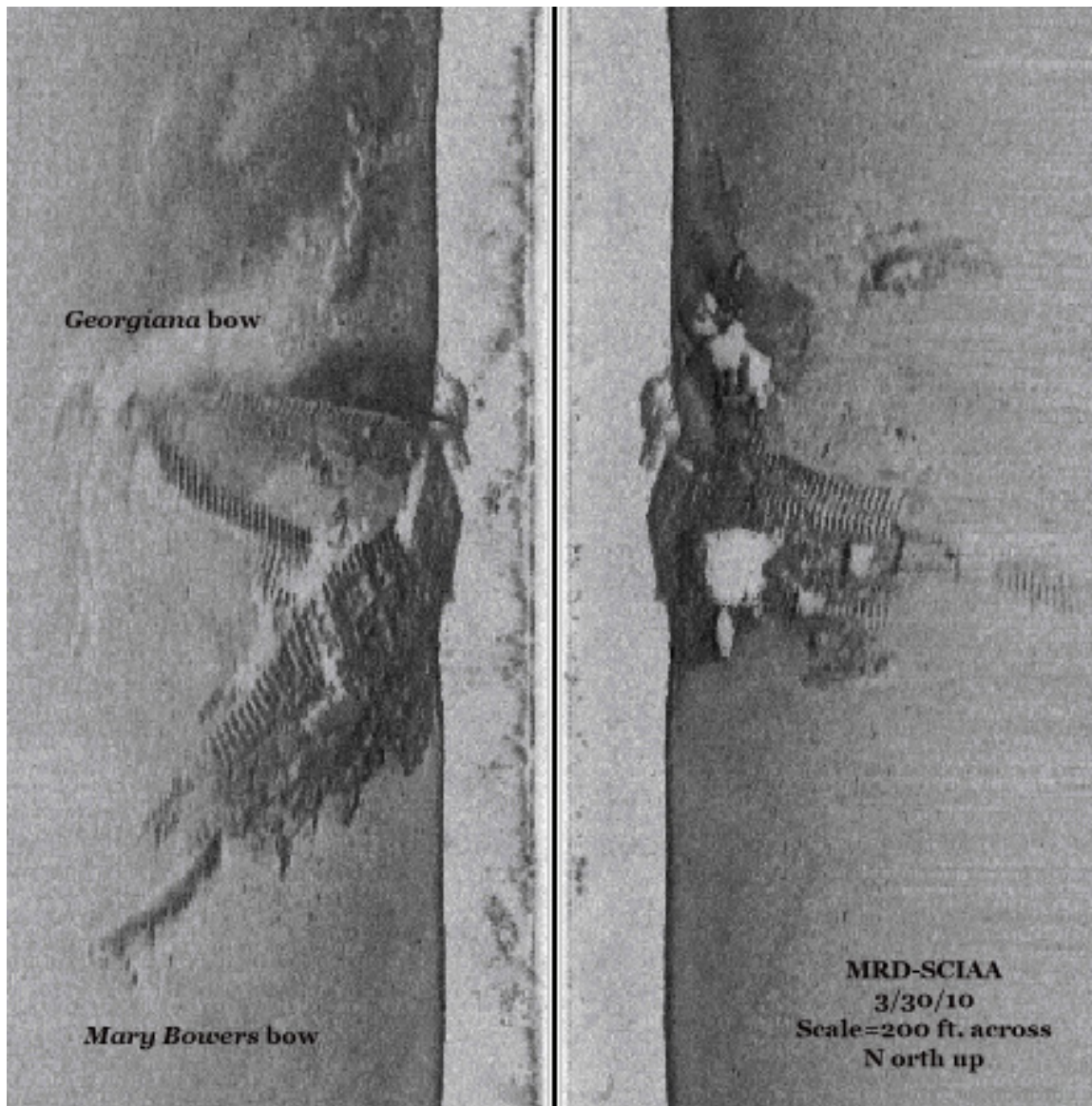


Fig. 7: Sonogram of the wrecked blockade-runners *Georgiana* lying underneath *Mary Bowers*. (SCIAA graphic)

the project will serve to guide short and long-term management decisions affecting the integrity and preservation of this maritime battlefield. Some potential issues affecting the preservation of the battlefield

project webpage that provides more information about the project, as well as a virtual tour of the battlefield consisting of a series of captioned slideshows relating to the Union and Confederate shipwrecks,

USC Archaeologist Helps Dig a Dugout Canoe Near Daufuskie Island

By Peggy Binette, Media Specialist for the University of South Carolina, College of Arts and Sciences



Fig. 1: View of the dugout canoe protruding out of the marsh shortly after its discovery. SCIAA photo)

A dugout canoe that may date back to the 18th century has been recovered on Turtle Island, a small island south of Daufuskie Island by University of South Carolina archaeologists and residents of the sea island. The canoe, hewn from a single log, was discovered this summer by Daufuskie Island resident John Hill on Turtle Island, an area named for the sea turtles that nest there. It was partially protruding from the marsh grass in which it was buried.

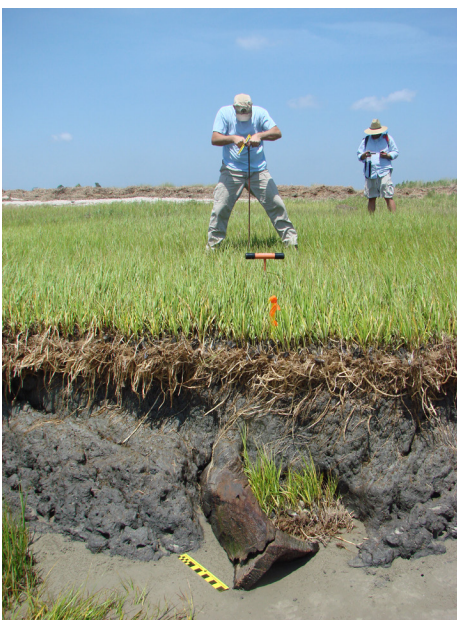


Fig. 2: James Spirek probes to the end of the canoe in the marsh. John Hill who found the canoe is in the background. (SCIAA photo)

by Colonial settlers or from a later period is open for speculation at this point."

Local preservationist and marina owner William "Wick" Scurry has sent a sample of the canoe's wood for identification and radiocarbon dating. It was most likely made from pine or cypress. The results will provide a date range of when the tree was cut down and presumably when the canoe would have been hewn. It also will provide some archaeological clues as to who constructed it and how.

Scurry, Hill, Spirek and Joe Beatty, also with SCIAA, were among those who helped free the canoe that was entombed in the marsh mud. Unfortunately, the grip of the mud was too great, and the canoe split into three pieces.

The canoe, transported by pontoon to the Freeport Marina, currently resides

"The visible end suggested it was hewn by iron tools," said Jim Spirek, the state underwater archaeologist with USC's S.C. Institute of Archaeology and Anthropology (SCIAA). "Whether it was built by historic-period Native American Indians influenced by European designs or

in a tank at Scurry's restaurant, the Old Daufuskie Crab Company, as Spirek finalizes a conservation plan. "We need to impregnate the waterlogged canoe with polyethylene glycol called PEG to help bulk the wood cells. Once we have the desired saturation level of PEG, we will slowly air dry the canoe for eventual display in the restaurant," Spirek said. Relatively few dugout canoes have been found in the lower coastal area of South Carolina, which makes this canoe a significant find, said Spirek. Other canoes recovered from the region include the Parris Island Canoe, a prehistoric dugout canoe recovered from the shore of Parris Island in the 1980s, and a canoe found in the flood plain of the Savannah River a couple of years ago that now resides in the Blue Heron Nature Center in Ridgeland, S.C." Research of the Turtle Island Canoe



Fig. 3: Dugout canoe protruding from marsh bank. (SCIAA photo)

will offer us new insights into the early settlement of the state's Lowcountry region," he said.

Spirek said the canoe is an example of a public-private partnership. The canoe is state property, but private initiative is driving its preservation. "Community involvement with historical projects such as this invests citizens as well as civic and business leaders to protect their

local maritime archaeological record, which is part of South Carolina's overall archaeological record," Spirek said. "SCIAA helps by providing expertise, in this case experience with canoes. By working together, the local community and the state can preserve and interpret these unique and non-renewable cultural resources for all South Carolinians and visitors to our state."



Fig. 4: View of erosion and loss of half the end of the canoe due to erosion and waves. (SCIAA photo)



Fig. 5: Excavating the buried end of the canoe to ascertain the overall length and preservation status. Clockwise: John Hill, resident; Joe Beatty, SCIAA; James Spirek, SCIAA, and Wick Scurry, resident. (SCIAA photo)



Fig. 6: Recovery operations to extract canoe from the marsh and move to Daufuskie Island. (SCIAA photo)



Fig. 7: View of recovery operations to begin extraction of canoe from the marsh and removal to Daufuskie Island, (SCIAA photo)



Fig. 8: Turtle Island Dugout Canoe in conservation and viewing tank at restaurant on Daufuskie Island. (SCIAA photo)

2012 Underwater Archaeology Field Training Course

By Ashley Deming- Sport Diver Archaeology Management Program, Maritime Research Division, SCIAA

Part I FTC

Over the weekend of June 23 and 24, 11 students (all of whom are licensed scuba divers) attended the Sport Diver Archaeology Management Program (SDAMP) underwater archaeology Field Training Course (FTC) at Fort Johnson Marine Resource Center in Charleston. Through a series of lectures and hands-on activities, SDAMP manager Ashley Deming and archaeological technician Carl Naylor instructed students on the techniques of scientifically recording underwater sites.

The students spent Saturday morning in the Department of Natural Resources classroom of the Maritime Resources Research Institute listening to lectures on the types of underwater sites in South Carolina, as well as the theory pertaining to recording underwater sites. After a practice session in the classroom, all 11 students headed outside in the afternoon, thankfully in the shade, to a mock wreck site set up on the lawn. Students divided into buddy pairs to attempt to record the site. The site contained five separate "stations," including a mock wreck, two one-meter grid frames, an artifact scatter, and an anchor site. Students practiced drawing measured sketches, measuring from a central baseline, and triangulating each station back to the wreck to create an accurate site plan. The students did an incredible job with their first stab at archaeological recording.

On Sunday, the FTC students met SDAMP staff at a scuba training pond just outside Mt. Pleasant, SC, for the underwater component of the course. A similar mock site to the one students had worked on the previous day was set up underwater for them to try their newfound skills in a more challenging environment. Again, students were paired off to work in teams on each of the five underwater stations. The students performed admirably with the new underwater factor

and came up with some very impressive drawings for their first experience.

Part II FTC

Once students pass Part I, they are eligible for Part II. Part II offers students the opportunity to move to the next level of training where they work on a real wreck site in South Carolina along with Maritime Research Division staff. Three students participated in the 2012 Part II FTC, which took place from July 12-15 on Hilton Head Island.

The wreck that was the focus of this project was reported to SCIAA in late 2010. SDAMP went to look at the wreck in March of 2011. The wreck is beached not far from Harbour Town in Sea Pines Plantation. Only a small portion of the wreck outline (six meters) could be seen exposed above the sands at low tide. Immediately, it was obvious that the wreck needed further study and that it would make a wonderful FTC project. Plans developed over the next year to determine how to excavate and record the wreck using the help of students. The goals for the project were twofold; 1) to record the

wreck before the elements deteriorated it much further and 2) teach students how to effectively record a real shipwreck site.

While working on the project, staff, including Ashley Deming, Carl Naylor, and Joe Beatty, and students stayed at DNR's researcher housing at Waddell Mariculture Center in Bluffton. Students met staff there in the afternoon of July 12 for a brief refresher course on shipwreck mapping and to discuss the plans for the next day. After being shown images of the site and discussing the methodology that would be used, students were very excited to get out to the site the following morning.

Each morning everyone helped load up the pontoon boat, and the crew headed out to the Broad Creek public boat landing. From there the FTC Part II team motored out into Calibogue Sound and up to the wreck. The total trip from Waddell to the site took about one hour. This meant being on the road by no later than 7:30 AM each morning to make the most of the tides. We had only about four hours each day to excavate and record before being forced out by the incoming tide.



Fig. 1: 2012 Field training Course: Part II: Students excavate beached wreck site on Hilton Head Island (L to R: Brianna Blacklock, Don Davis, Bruce Orr, Ashley Deming, Joe Beatty. Not pictured: Carl Naylor). (SCIAA photo)



Fig 2: 2012 Field Training Course: Part II: Team who worked on the Hilton Head Island Wreck (L to R: Don Davis, Brianna Blacklock, Ashley Deming, Bruce Orr. Not Pictured: Carl Naylor and Joe Beatty) (SCIAA photo)

Students worked diligently each day to reveal and record more and more of the wreck. Shovels and trowels were used to get through the first layer of sand and oyster shell, a layer of sand, then mud as the sun pounded down on our heads. The work was backbreaking, but uncovering history was well worth it. Each day we uncovered more frames, planking, the keelson, and a few ballast stones. Carl and Joe expertly filled sand bags while the students worked on recording the site. Everyone had a job to do and enjoyed themselves despite the heat.

The site was separated into six sections (A-F) using surveyor's tapes to accurately record the site. Only A and F were excavated during this FTC as these sections were expected to yield the most information. The team excavated to the 50 centimeter level in the time allotted for the project. At the end of each day, the team filled the wreck back in with the sand bags to minimize damage to the exposed areas and to create a layer signifying where the work had finished the day before. Once the sand bags were in place, the pontoon was loaded back up, and we headed back to Waddell to draw up the measurements from the day on gridded drafting paper.

The team decided to dig a test pit outside the wreck to determine definitively if we were looking at the bow or the stern.

The pit revealed sacrificial planking, a draft mark, and a fabric presumably treated with a sealant. Additionally, the bluff shape of the exposed remains strongly suggested that we were working in the bow section of the wreck. The draft mark is a Roman numeral two, meaning that it is two feet above the keel of the vessel.

The vessel appears to be listing to its starboard side, so there is much more to uncover to get down to the starboard frames and planking. The port side is almost entirely gone, but it still retains some inner and outer hull planking. There is significant evidence of burning in the frames and planking and quite a bit of charcoal has gathered inside near the stempost. The burning event appears to have taken place after the vessel was deposited on the beach, as we would expect to see a more even burn line should it have happened while the vessel was upright on the water.

Very few artifacts have been found so far, but more may be uncovered in the depths of the starboard side. The team did uncover a wine glass stem that may date to the 1750s, a piece of salt-glazed stoneware, and a wooden sheave. The wine glass was found high in the sand matrix of the site, reducing the likelihood of it being associated with the wreck. The stoneware

was uncovered in the test pit next to the outer hull, thus calling into question its origins. The sheave is the only artifact that most likely can be associated with the wreck as it was buried in mud stuck between the stempost and the first cant frame. The sheave is in excellent condition and appears to be made of Lignum Vitae, which is a very hard wood often used for ship fittings due to its denseness and resistance to water damage.

Samples of the charcoal, wood from the wreck, fabric, and the other artifacts have been brought back to the SDAMP office in Charleston for further analysis. All artifacts are being kept in fresh water that is periodically changed out to lower the salinity in the artifacts and keep them stable until further conservation can be done.

Much more work needs to be done on this wreck to ascertain its age, how it came to be in that location, and how it was used (i.e. warship, cargo vessel, pleasure craft). Current plans are to revisit the site next year with another group of students. The students from the 2012 season are all interested in coming back next year and helping out with future Maritime Research Division projects.

Many thanks to USC's Office of Media Relations for helping to promote this project locally and nationally. Thanks to Piggly Wiggly for their support with feeding our hungry troops. A very special thank you to the Hobby Diver, who would like to remain anonymous, for donating 300 sand bags to the project. Last, but not least, thank you to all of the staff and students who made this project possible. We had an incredible time and are all looking forward to returning for the 2013 season.

Students participating in the Field Training Course Part I, include Brianna Blacklock, Sandra Boyd-Spoden, Shane Carter, Nate Fulmer, Mark Hall, Bruce Orr, Owen Osborne, Richard Painter, Rick Presnell, Carl Purdy and Mike Slot. The Part II students were Brianna Blacklock, Don Davis and Bruce Orr.

Savannah River Archaeology Research

Halfway to Mörön: Shedding New Light on Paleolithic Landscapes of Northern Mongolia

By J. Christopher Gillam¹, Sergei A. Gladyshev², Andrei V. Tabarev², B. Gunchinsuren³, and John W. Olsen⁴

Between Mongolia's capital, UlaanBaatar, and the provincial city of Mörön, lay the ancient Khangai Mountains of north-central Mongolia. In the past decade, the Joint Mongolian-Russian-American Archaeological Expedition (JMRAAE) has discovered numerous archaeological sites (n=36) dating to the Pleistocene and early Holocene along the Ikh-Tulberiin (hereafter, Tolbor), Kharganyin, and Altatyn rivers of the greater Selenge River Basin (Gladyshev et al. 2011, 2012; Olsen 2002, 2004). The region is best described as high, cold, and dry with little arable land, a mountainous forest-steppe, known as the Selenge-Orkhon forest-steppe. Much of the rural populous today remain semi-nomadic herders of a variety of livestock including sheep, goats, cattle (cow and yak), horse, and camel (Fig. 1); a way of life that began here some 6,000 years ago during the Early Bronze Age (Okladnikov 1990). Primary transport for herders is

the Mongol horse and occasionally the Bactrian camel. Most nomads still live in the traditional Mongolian Ger, a robust and portable dwelling that can be (de)constructed in a few hours (Fig. 2).

The landscape is dominated by mountain forest-steppe grasslands with less than 20-percent forest cover (Fig. 3). Forest stands primarily occur along river banks and north-facing Mountain slopes, these are the only places that retain enough moisture to support them in the cold, dry, continental climate. Forest patches



Fig. 2: Erecting a Mongolian Ger for a field lab, others served as housing and a mess hall. (Photo courtesy of J. Christopher Gillam)

on mountain slopes are dominated (80-percent) by the Siberian Larch (*Larix sibirica*), as well as, varying densities of White Birch (*Betula platyphylla*) and Siberian pines (*Pinus sibirica* and *Pinus silvestris*). These are sporadically inter-mixed with riverbank stands of Mongolian Willow (*Salix mongolica*) and open stands of Siberian Elm (*Ulmus pumila*), Aspen (*Populus tremula*), and Alder (*Alnus incana*) on adjacent plains and the terraced transitions to rocky mountain slopes (see also, Tarasov et al. 2007).

These woody resources are used by local nomads today as they were in the distant past. Larch is a semi-deciduous conifer providing timber that is very resistant to rot, making it an excellent and expedient construction material. Willow is used extensively in Ger construction, forming the walls' flexible lattice structure that is wrapped in heavy wool felt and an outer layer of canvas (Fig. 2), as well as for spindles in the wheel-like roof cap and for baskets, and so on. Pines provide nuts and timber. Birch bark has many traditional and continued uses, such as



Fig. 1: Herd of Bactrian Camels at the Tolbor base camp. (Photo courtesy of J. Christopher Gillam)



Fig. 3: A westward view of the Tolbor Valley is a typical landscape of the Selenge-Orkhon forest-steppe. (Photo courtesy of J. Christopher Gillam)

cladding, basketry, and tender. Fallen branches of short-lived Aspen and Alder trees and dried dung are used as an expedient heating and cooking fuel. The life of a nomad is difficult, but rewarding in its traditions, continuity, and prided simplicity, as compared to urban life in Mongolia's capital, where there are few opportunities and nearly half of the country's three million people.

The archaeological deposits indicate an initial occupation of the region during the early Upper Paleolithic (ca. 40,000 years before present; hereafter, cal. B.P.; Gladyshev et al. 2010). Typical early Upper Paleolithic (40,000-25,000 cal. B.P.) stone artifacts include flake and blade cores, large flakes, large blades, scrapers, points, denticulates, and burins (Fig. 4; Derevianko et al. 2007). The Middle Paleolithic (25,000-16,000 cal. B.P.) is dominated by large flake cores and a flake tool industry. Late Upper Paleolithic (16,000-12,000 cal. B.P.) and early Holocene (12,000-9,000 cal. B.P.) forms are dominated by micro-blades, wedge-shaped and prismatic micro-blade cores, small flake tools, endscrapers, sidescrapers, points, and burins. Stone raw materials are locally abundant on hillside outcrops and in streambed gravels.

Each produce conchoidal fractures and are similar in texture and color, making field identification cumbersome, consisting of very fine-grained and dark gray: metamorphic sedimentary rocks (orthoquartzite/sandstone and, rarely, flint/chert and (red) jasper), foliated metamorphic sedimentary rocks (aleurolite/siltstone), and aphanitic igneous rocks (basalt and rhyolite).

Although the focus of the project is on the Paleolithic, significant archaeological remains exist from many time periods, as is made readily apparent by perhaps hundreds of more recent stone circular and rectangular Khirigsuurs, or "deer mounds," as they are called (Fig. 5; Okladnikov 1990; Wright 2007). These are ritual places and often contain burials of significant figures from the more recent millennia of

the Bronze and Early Iron ages. Like the Paleolithic sites of the region, the mounds tend to be located on prominent locations, particularly western slopes visible from the valley floor. These burial mound placements are symbolically on the side of the setting sun and visible from the valley below as a territorial marker, of sorts. The Paleolithic sites are similarly placed, but for more utilitarian purposes such as maximum sun exposure for warmth, being free of forest cover, with good views of passing animal herds for hunting, and in relatively high locations that were safe from the stampede of large herbivores.

Beginning in 2011, a Geographic Information System (GIS) has been developed to explore the nature of the region's Paleolithic landscapes. There were multiple objectives to developing the geographic database. The first was to accurately record the location of each site found in prior field seasons (Fig. 6). We relocated each site, made surface collections of artifacts, recorded the perimeter of the site, and the approximate site center. Artifacts collected enabled us to confirm and refine the chronology of site occupation and also provided an expedient sample of stone raw materials used by prehistoric populations. The second objective was to explore the eastern banks of the Tolbor River as prior surveys had focused on the western half of the basin adjacent to the access road that



Fig. 4: Some common Paleolithic artifacts of northern Mongolia include the wedge-shaped blade core, pointed flake tool, and large blade. (Photo courtesy of J. Christopher Gillam)



Fig. 5: Khrigsuurs, or “Deer Mounds,” are common ceremonial features of the Bronze Age landscape; Siberian Larch (*Larix sibirica*) trees at flanks. (Photo courtesy of J. Christopher Gillam)

parallels the river. The third objective was to develop topographic maps using data from the 90-meter resolution Shuttle Radar Topography Mission (SRTM) Digital Elevation Model (DEM) to enable a better understanding of site location and identify new locations for archaeological survey. The latter proved particularly fruitful as described below.

Initial results from GIS analyses confirm a settlement preference for south- and east-facing slopes with good viewsheds of surrounding terrain. Analysis of local topography identified the location of a significant saddle in the mountainous terrain separating the Tolbor (Ikh-Tulberiin) from the Kharganyn and Altatyn rivers. The saddle, still in use by local herders, has archaeological evidence of continued use from at least the early Upper Paleolithic (ca. 40,000 cal. B.P.) to modern times. The Saddle site also lies nearly due east and within the viewshed of a previously recorded middle Upper Paleolithic large flake cache (n=57 artifacts; ca. 25,000-16,000 cal. B.P.) that is unique to the region, bringing into focus the locational meaning of this significant cultural feature (Fig. 7). That is, it was a ceremonial and symbolic placement on the landscape. A stone tool cache, likely an

offering for continued prosperity, facing the promise of the rising sun and the corridor to an adjacent valley where game and humanity alike make pass.

Future research will include more geographic modeling of the cultural and natural landscapes of the region. Initial results enabled us to identify a primary migration and trade route between valleys, and yielded numerous new sites in upland locations and adjacent valleys that were previously unknown and unexplored. In 2013, primary fieldwork will continue at newly found Paleolithic sites of the Kharganyn and Altatyn rivers across the saddle from the Tolbor Valley.

Acknowledgments

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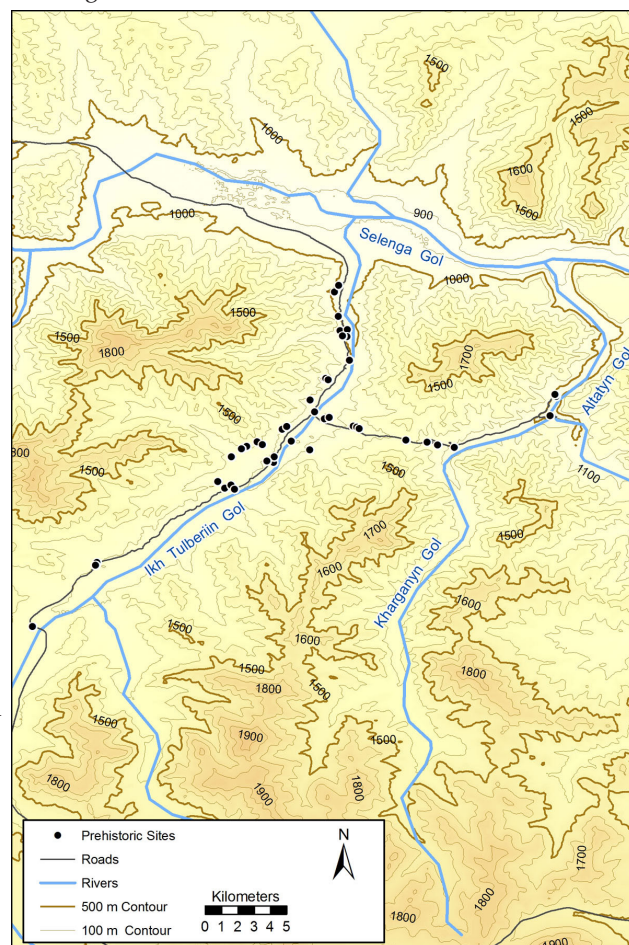


Fig. 6: Map of Paleolithic archaeological sites recorded by the JMRAAE expeditions (2002-2012). (Map courtesy of J. Christopher Gillam)

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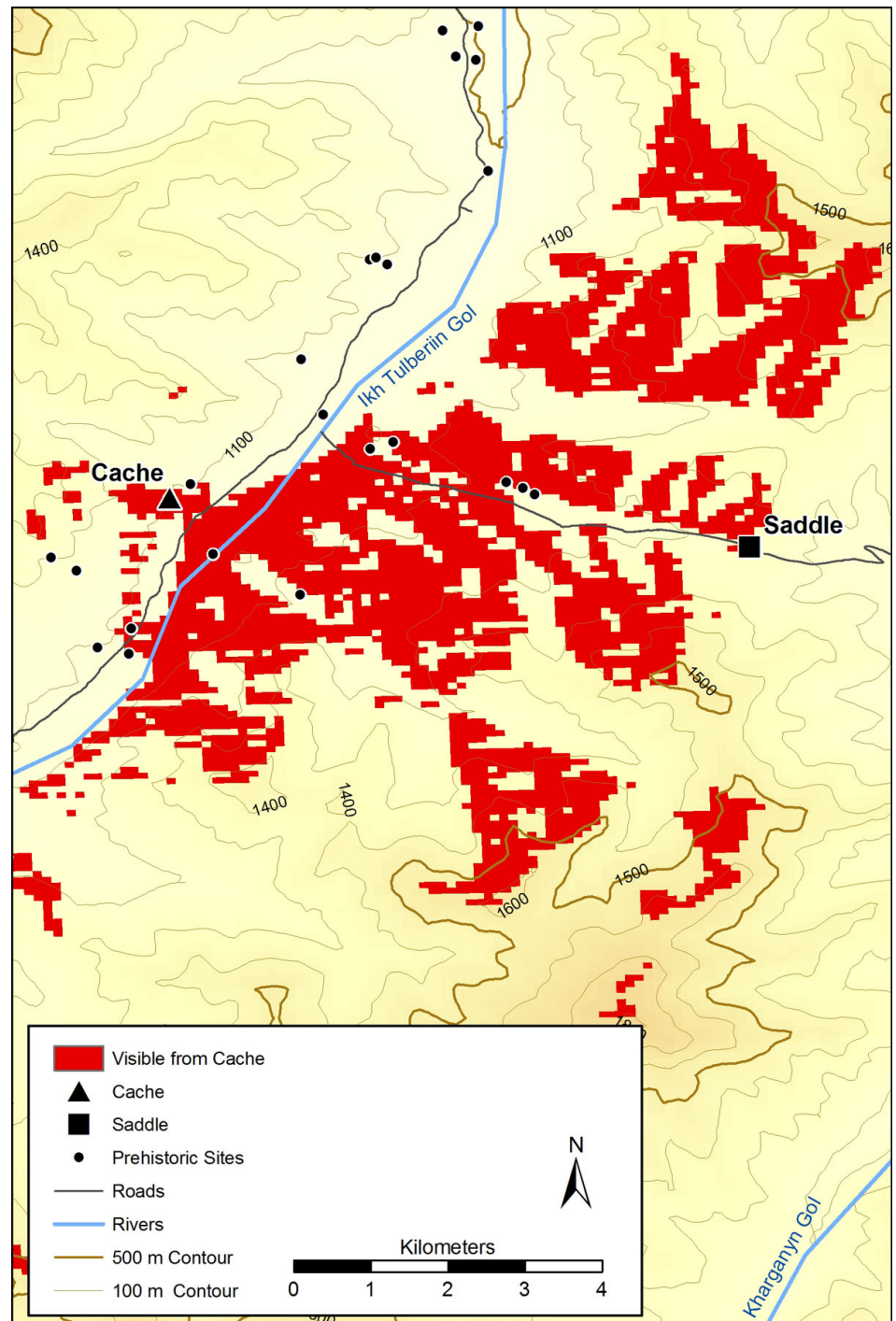


Fig. 7: A GIS viewshed analysis demonstrates the symbolic relationship of a unique Middle Paleolithic flake cache to the primary passageway between the Tolbor and Kharganyin/Altatyn valleys. (Photo courtesy of J. Christopher Gillam)

Research

Study in *Proceedings of the National Academy of Sciences* Puts the University of South Carolina Topper Site in Middle of Comet Controversy

By Peggy Binett, Media Specialist for the University of South Carolina, College of Arts and Sciences

Did a massive comet explode over Canada 12,900 years ago, wiping out both beast and man in North America and propelling the earth back into an ice age?

That's a question that has been hotly debated by scientists since 2007, with the University of South Carolina's <http://www.sc.edu/> Topper archaeological site right in the middle of the comet impact controversy. However, a new

study <http://bit.ly/RizD6r> published September 17, 2012 in the *Proceedings of the National Academy of Sciences* <http://www.pnas.org> (PNAS) provides further evidence that it may not be such a far-fetched notion. USC archaeologist Albert Goodyear is a co-author on the study entitled, "Independent Evaluation of Conflicting Microspherule Results from Different Investigations of the Younger

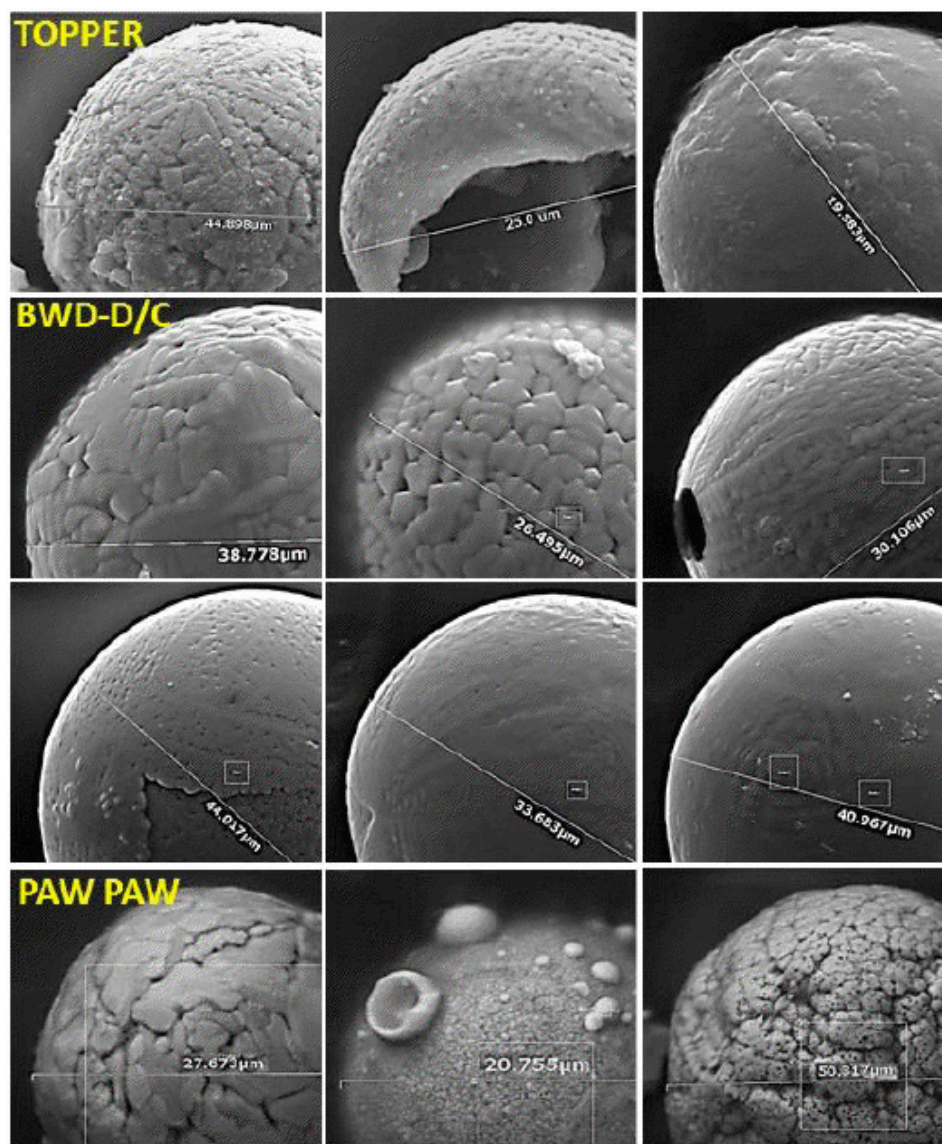
Dryas Impact Hypothesis," by Malcolm A. LeCompte, Albert C. Goodyear, Mark N. Demitroff, Dale Batchelor, Edward K. Vogel, Charles Mooney, Barrett N. Rock, and Alfred W. Seidel, that upholds a 2007 PNAS study by Richard Firestone, a staff scientist at the Department of Energy's Lawrence Berkeley National Laboratory.

Firestone found concentrations of spherules (micro-sized balls) of metals and nano-sized diamonds in a layer of sediment dating 12,900 years ago at 10 of twelve archaeological sites that his team examined. The mix of particles is thought to be the result of an extraterrestrial object, such as a comet or meteorite, exploding in the earth's atmosphere. Among the sites examined was USC's Topper, one of the most pristine U.S. sites for research on Clovis, one of the earliest ancient peoples.

"This independent study is yet another example of how the Topper site with its various interdisciplinary studies has connected ancient human archaeology with significant studies of the Pleistocene," said Goodyear, who began excavating Clovis artifacts in 1984 at the Topper site in Allendale, S.C. "It's both exciting and gratifying."

Younger-Dryas is what scientists refer to as the period of extreme cooling that began around 12,900 years ago and lasted 1,300 years. While that brief ice age has been well-documented—occurring during a period of progressive solar warming after the last ice age—the reasons for it have long remained unclear. The extreme rapid cooling that took place can be likened to the 2004 sci-fi blockbuster movie "The Day After Tomorrow."

Firestone's team presented a provocative theory: that a major impact event—perhaps a comet—was the catalyst.



Microspherule montage from LeCompte, et.al.



Clovis artifacts from the Topper site. (SEPAS Photo)

His copious sampling and detailed analysis of sediments at a layer in the earth dated to 12,900 years ago, also called the Younger-Dryas Boundary (YDB), provided evidence of micro-particles, such as iron, silica, iridium, and nano-diamonds. The particles are believed to be consistent with a massive impact that could have killed off the Clovis people and the large North American animals of the day. Thirty-six species, including the mastodon, mammoth, and saber-toothed tiger, went extinct.

The scientific community is rarely quick to accept new theories. Firestone's theory and support for it dominated the annual meeting of the American Geophysical Union and other gatherings of Paleoindian archaeologists in 2007 and 2008.

However, a 2009 study led by University of Wyoming researcher Todd Surovell, failed to replicate Firestone's findings at seven Clovis sites, slowing interest and research progress to a glacial pace.

This new PNAS study refutes Surovell's findings with its lack of reported

evidence.

"Surovell's work was in vain because he didn't replicate the protocol. We missed it too, at first. It seems easy, but unless you follow the protocol rigorously, you will fail to detect these spherules. There are so many factors that can disrupt the process. Where Surovell found no spherules, we found hundreds to thousands," said Malcolm LeCompte, a research associate professor at Elizabeth City State University and lead author of the newly released PNAS article.

LeCompte began his independent study in 2008 using and further refining Firestone's sampling and sorting methods at two sites common to the three studies—Blackwater Draw in New Mexico and Topper. He also took samples at Paw Paw Cove in Maryland, a site common to Surovell's study.

At each site, he found the same microscopic spherules, which are the diameter of a human hair and distinct in appearance. He describes their look as tiny black ball bearings with a marred surface pattern that resulted from being crystalized in a molten state and then

rapidly cooled. His investigation also confirmed that the spherules were not of cosmic origin but were formed from earth materials due to an extreme impact.

LeCompte said it was Topper and Goodyear's collaboration, however, that yielded the most exciting results.

"What we had at Topper and nowhere else were pieces of manufacturing debris from stone tool making by the Clovis people. Topper was an active and ancient quarry at the time," LeCompte said. "Al Goodyear was instrumental in our approach to getting samples at Topper."

Goodyear showed LeCompte where the Clovis level was in order to accurately guide his sampling of sediments for the Younger Dryas Boundary layer. He advised him to sample around Clovis artifacts and then to carefully lift them to test the sediment directly underneath.

"If debris was raining down from the atmosphere, the artifacts should have acted as a shield preventing spherules from accumulating in the layer underneath. It turns out it really worked!" Goodyear said. "There were up to 30 times more spherules at and just above the Clovis surface than beneath the artifacts."

LeCompte said the finding is "critical and what makes the paper and study so exciting. The other sites didn't have artifacts because they weren't tool-making quarries like Topper."

While the comet hypothesis and its possible impact on Clovis people isn't resolved, Goodyear said this independent study clarifies why the Surovell team couldn't replicate the Firestone findings and lends greater credibility to the claim that a major impact event happened at the Younger Dryas Boundary 12,900 years ago.

"The so-called extra-terrestrial impact hypothesis adds to the mystery of what happened at the YDB with its sudden and unexplained reversion to an ice age climate, the rapid and seemingly simultaneous loss of many Pleistocene animals, such as mammoths and mastodons, as well as the demise of what archaeologists call the Clovis culture," Goodyear said. "There's always more to



Excavation of Clovis floor at the Topper site. (SEPAS photo)

learn about the past, and Topper continues to function as a portal to these fascinating mysteries.”

Dr. Albert Goodyear joined USC’s College of Arts and Sciences <<http://artsandsciences.sc.edu/>> and its South Carolina Institute for Archaeology and Anthropology <<http://artsandsciences.sc.edu/sciaa/>> in 1974 to pursue prehistoric archaeology.

The Topper Story

Al Goodyear, who conducts research through the University of South Carolina’s S.C. Institute of Anthropology and Archaeology, began excavating Clovis artifacts along the Savannah River in Allendale County in 1984. It quickly became one of the most documented and well-known Clovis sites in the United States. In 1998, with the hope of finding evidence of a pre-Clovis culture earlier than the accepted 13,100 years, Goodyear began focused excavations on a site called

Topper, located on the property of the Clariant Corporation near Martin, South Carolina in Allendale County..

His efforts paid off. Goodyear unearthed small tools such as scrapers and blades made of the local chert that he believed to be tools of an ice age culture dating back some 16,000 years or more. His findings, as well as similar ones yielded at other pre-Clovis sites in North America, sparked great change and debate in the scientific community.

Goodyear reasoned that if Clovis and later peoples used the chert quarry along the Savannah River, the quarry could have been used by even earlier cultures.

Acting on a hunch in 2004, Goodyear dug even deeper into the Pleistocene terrace and found more artifacts of a pre-Clovis type buried in a layer of sediment stained with charcoal deposits. Radiocarbon dates of the burned plant remains yielded ages of 50,000 years, which suggested man was in South

Carolina long before the last ice age.

Goodyear’s findings not only captured international media attention, but it has put the archaeology field in flux, opening scientific minds to the possibility of an even earlier pre-Clovis occupation of the Americas.

Since 2004, Goodyear has continued his Clovis and pre-Clovis excavations at Topper. With support of Clariant Corporation and SCANA, plus over 700 individual donors, an expansive shelter and viewing deck now sit above the dig site to allow Goodyear and his team of graduate students and public volunteers to dig free from the heat and rain and to protect what may be the most significant early-man dig in America.

The Topper Timeline

1998—Goodyear and his team dig to a meter below the Clovis level and encounter unusual stone tools up to two meters below the surface.

1999—Team of outside geologists visit the Topper site and propose a thorough geological study of the location.

2000—Geological study is conducted by consultants; ice age sediment is confirmed for pre-Clovis artifacts.

2001—Geologists revisit Topper and obtain ancient plant remains deep in the Pleistocene terrace. Optically stimulated luminescence (OSL) dates sediment above ice-age strata show pre-Clovis is at least older than 14,000 years.

2002—Geologists find new profile showing ancient sediment lying between Clovis and pre-Clovis, confirming the age of ice age sediment layer between 16,000 – 20,000 years.

2003—Archaeologists continue to excavate pre-Clovis artifacts above the Pleistocene terrace. New and significant Clovis artifacts are found.

2004—Goodyear discovers major Clovis occupation on the hillside. Additionally, radiocarbon dates for sediment associated with pre-Clovis artifacts come back at 50,000 years.

2005—“Clovis in the Southeast” conference held in Columbia, SC, with tours of Topper and Big Pine Tree sites.

2006—The 3,500-square-foot roofed structure is built over pre-Clovis excavations.

2007—Firestone study about a possible Clovis comet is published in the *Proceedings of the National Academy of Sciences*, including evidence from Clovis age sediments from Topper.

2008—PBS “Time Team America” spends a week at Topper filming for an hour-long television special devoted to Topper.

2008—SCETV broadcast of “Finding Clovis,” a public television presentation of Topper Clovis.

2009—PBS “Time Team America” program airs.

2011—Topper and Big Pine Tree included in a study of post-Clovis Paleoindian decline/reorganization that is published in the journal *Quaternary International*.

2011—The first permanent exhibit of Topper artifacts installed at the University of South Carolina Salkehatchie. in Allendale, South Carolina.

2012—Independent study of microspherules related to an extra-terrestrial impact hypothesis is published in the *Proceedings of the National Academy of Sciences* using Clovis-age sediments from Topper that confirm the original 2007 Firestone study.

2013—The pre-Clovis occupation of Topper will be presented in October at the international conference on the peopling of the Americas, titled “Paleoamerican Odyssey,” in Santa Fe, N.M. <http://www.paleoamericanodyssey.com/>.



Macro blades from the Clovis level of the Topper site. (SEPAS photo)

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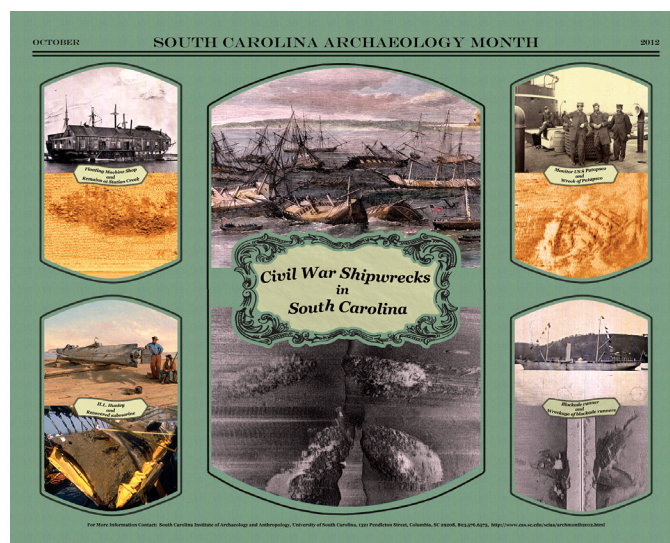
By James Spirek, Christopher Amer, and Nena Powell Rice

The SC Institute of Archaeology and Anthropology (SCIAA) at the University of South Carolina celebrated the 21st Annual South Carolina Archaeology Month in October 2012. The fall event focused on bringing awareness to the numerous cultural programs that are offered in every corner of the state during Archaeology Month and throughout the year. Each year, the month-long event produces a topical poster focusing on current archaeological research in the Palmetto state. The theme for this year's South Carolina Archaeology Month poster is "Civil War Shipwrecks in South Carolina." A number of shipwrecks from the conflict remain on the bottom of the state's waterways including Federal warships, Confederate support vessels, and blockade-runners. The poster design this year is inspired by the layouts drawn during the war in the Northern illustrated newspaper, *Harper's Weekly*. Citizens and soldiers eagerly awaited their copy of the newspaper to not only read the articles, but also to see the numerous illustrations drawn by eyewitnesses of the battles and events fought on land and sea. The poster layout is similar to a large two-page spread showing a variety of vignettes of particular events of the war. The poster front has several compositions of historical images of several watercraft above the archaeological remains of the same vessels enclosed in a decorative element of hawse line. These historical-archaeological vignettes include one of the shipwrecks comprising the Union Floating Machine

Shop at Station Creek, Port Royal Sound, the wreck of USS *Patapsco*, the Confederate submarine *H.L. Hunley*, the wrecked blockade runners *Georgiana* and *Mary Bowers*, and the shipwrecks associated with the sinking of the First Stone Fleet by the Union navy. These last four sites are, or were in regards to the since recovered submarine, located off Charleston Harbor. The back of the

poster has several articles and additional images providing supplementary information about these shipwrecks featured on the front. An introductory article provides context for the shipwrecks by discussing the role of the U.S. navy, especially the South Atlantic Blockading Squadron, during the war in state waters. Additionally, the poster back has a map showing the distribution of the Civil War shipwrecks along the coast and waterways of South Carolina. James Spirek and Christopher Amer of the Maritime Research Division were charged with the production of this year's poster.

Archaeology Month activities took place in October 2012 with a variety of statewide events focusing on prehistory, history, culture, and historic preservation. The 25th Annual South Carolina Archaeology Field Day sponsored by the



2012 South Carolina Archaeology Month poster. (Designed by James Spirek and Christopher Amer)

Archaeological Society of South Carolina (ASSC) was held at Santee State Park on Saturday, October 20, 2012 from 10 AM-5 PM, and the Lantern Tour was rejuvenated and was offered from 6:30-8 PM. Please check out the ASSC website at: <http://www.assc.net/events/>

For a list of scheduled events in connection with Archaeology Month and programs offered throughout the year at numerous archaeological organizations, visit the SCIAA website: <http://www.cas.sc.edu/sciaa>. Contact Nena Powell Rice (nrice@sc.edu) at SCIAA at (803) 576-6573 for further details about South Carolina Archaeology Month each year in October. Another website of archaeological interest in South Carolina is the Council of South Carolina Professional Archaeologists <http://coscapa.org>. Please come by SCIAA at 1321 Pendleton Street in Columbia, and pick up your free posters!